Combat equipment of the 15A28 Sarmat ICBM

Warhead of the 15A28 Sarmat ICBM

There are hypothetically several options for the warhead of the 15A28 ICBM:

1. Classic warhead of an ICBM with a MIRV - conventional unguided ballistic warheads. Probably developed with the participation of VNIIEF - work is underway there on the Sarmat-P program (2018). There may be at least 10-14 such warheads. With a set of means to overcome missile defense systems.

2. Aeroballistic hypersonic warheads (AGBO) - an estimated 3 to 5 guided warheads of the Object 4202 / 15U71 type (this is a forecast).

Here we would like to consider the factors that may influence the choice of the power of conventional warheads, since the following options are possible: low-power blocks (150 kt), medium-power blocks (300-500 kt) and high-power blocks (0.8-1 Mt). Discussions on this topic are, of course, of a "captain's" nature and are completely obvious, but apparently this is precisely what is called "analytics" in the capitals.

The choice of the power of the warheads for the Sarmat ICBM may depend on a number of factors:

1. Strategic doctrine and nuclear deterrence issues are likely to be the fundamental factors in choosing the power of warheads. The quantity and power of a country's nuclear arsenal should correlate with strategic doctrine, which may prioritize mass deterrence or precision strikes. In the case of the Russian Federation, we are talking more about mass deterrence, and therefore this is an argument in favor of increasing the power of warheads. Here we can also add the psychological effect of having megaton-class warheads in the ICBM arsenal, which, incidentally, does not prohibit the deployment of missiles with warheads of a lower power class.

2. Tasks, purposes and accuracy of BB guidance. Of course, this is also one of the determining factors in choosing the power of warheads. In conditions of reduced requirements or impossibility of achieving the required indicators for the accuracy of BB guidance, compensation can be achieved by increasing the power of warheads to level out possible deviations. Again, if the targets of the Sarmat ICBM strikes are point targets - silos of the potential enemy's ICBMs, then with insufficient accuracy of the ICBM, it is also necessary to increase the power of the BB. Although, when using ICBMs as a means of nuclear deterrence, the main targets of the missiles will most likely be strategic infrastructure facilities, military bases, urban agglomerations, where megaton-class munitions also look preferable from the point of view of the deterrent factor of potential possible damage.

The warhead stage and the warhead of the 15A18M ICBM at the Strategic Missile Forces training center, 2022 (Russian TV).

Author: DIMMI Created: 23.04.2024 08:45:29 Comments: 0 READ THE FULL ARTICLE

System A, B-1000 missile - GAFFER

DATA AS OF 2024 (standard replenishment)
System "A", missile V-1000 - GAFFER Experimental multi-channel universal range missile defense system. Lead developer - SKB-30 (a subdivision of KB-1 for missile defense issues, later - Research Institute of Radio Instrument Making - NIIRP, now part of GSKB Almaz-Antey), chief designer - G.V. Kisunko . R & D to create the experimental complex "A" was conducted from 1953-1954. Development of a prototype ballistic missile tracking radar (an electronic warhead station in a spherical fairing) began in 1956. Based on the research results, on February 3, 1956, G.V. Kisunko made a report on the possibility of creating a missile defense system to the Presidium of the CPSU Central Committee. The preliminary design of the ABM system was ready in March 1956. Resolution of the Central Committee of the CPSU and the USSR Council of Ministers No. 1160-596 on the creation of an experimental ABM system "A" and a testing ground for it in the Betpak-Dala desert (Sary-Shagan testing ground) was issued on August 17, 1956. The resolution provided for the development of an experimental ABM system in the following cooperation: - the chief designer of the "A" system and the experimental RE radar was appointed G.V. Kisunko (SKB-30 / NIIRP); - the development of the V-1000 anti-missile - the chief designer P.D. Grushin (OKB-2); - the development of early warning radar projects was assigned to A.L. Mintz and A.I. Berg (according to other sources, A.L. Mintz and V.P. Sosulnikov); - the development of the anti-missile launch radar - S.P. Rabinovich; - development of the central computing station - S.A. Lebedev; - development of the data transmission system - F.P. Lipsman; - development of the anti-missile launcher - I.I. Ivanov; Deputy Chief Designer of the "A" system for the anti-missile guidance system since 1955 was O.V. Golubev.

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Monument to the V-1000 missile on a standard SM-71P launcher in the city of Priozersk, Sary-Shagan testing ground (http://militaryrussia.ru/forum).

Author: DIMMI Created: 28.03.2010 14:55:57 Comments: 43 READ THE FULL ARTICLE

RK-55 / 3K-12 Relief - SSC-X-4 SLINGSHOT

DATA FOR 2014 (standard update)
RK-55/3K-12/9A2413 "Relief" complex, KS-122/ 9B2413 missile - SSC-X-4 SLINGSHOT/TOMAHAWKSKI
★★★

Long-range cruise missile / mobile missile system with CRBD / operational-strategic missile system. The official design of systems with long-range air- and sea-based cruise missiles was started in the USSR by the Resolution of the USSR Council of Ministers on the creation of sea-, land- and air-based cruise missiles of December 9, 1976. Due to the fact that the system with a land-based missile was created by order of the USSR Air Force, it was initially planned to adapt the air-based cruise missile developed by the Raduga Design Bureau. After the intervention of D. F. Ustinov, the project was given to the Novator Design Bureau. The basis for this decision was that the sea-based cruise missile could be used in the land-based system with minimal modifications. In addition, some launches of the Granat 3M-10 sea-based missile had already been carried out from our launcher.

The development of the ground-based Relief complex with the KS-122 missile was assigned to the Novator Design Bureau (Sverdlovsk) in 1983, using the experience of creating and based on the Granat naval complex with the 3M-10 CRBD . Chief Designer - L.V. Lyulyev, responsible manager of work in the direction from the Novator Design Bureau and first deputy chief designer - A.F. Usoltsev. On behalf of the USSR Ministry of Aviation Industry, the development was supervised by Deputy Minister M.A. Ilyin. The complex was created as a counterweight to the American ground-based complex with the GLCM / BGM-109G Tomahawk CRBD. The decision of the USSR Ministry of Aviation Industry set the development period at 2 years.

The Relief operational-strategic missile complex was intended to solve operational-strategic tasks in the continental theater of military operations by destroying administrative-political and large military-industrial centers with pre-determined coordinates. The complex ensured combat use at any time of day or year, in any weather conditions, in mountainous and difficult terrain.

The development of the autonomous self-propelled launcher (ASPU), transport and loading vehicle, combat control vehicle (CCM) and ground equipment complex was carried out by NPP Start (Compressor Engineering Design Bureau, Sverdlovsk), the work was supervised by Deputy Chief Designer I.I. Voronin. The 9E2413 transport vehicle and 9Zh2413 loading vehicle for the missile complex were developed by the Design Bureau of the Novokramatorsk Machine-Building Plant (Kramatorsk, Ukraine, source). The prelaunch control equipment for missiles, on-board equipment and the system for preparing and entering flight missions were developed by NII-25 / Research Institute of Instrument Making (Moscow, Director - Aleksey Sergeevich Abramov), the responsible manager for the direction was Deputy Chief Designer / Director A.F. Kasatkin.

The internal name of the missile at the Novator Design Bureau is KS-122.

Self-propelled launcher 9V2413 of the RK-55 "Relief" complex - SSC-X-4 SLINGSHOT (Soviet Military Power, 1989).

Author: DIMMI Created: 04.11.2011 11:02:28 Comments: 203 READ THE FULL ARTICLE

R-3 / R-3A (project)

DATA FOR 2024 (standard update)
R-3 / 8A67
Missile R-3A
★★★

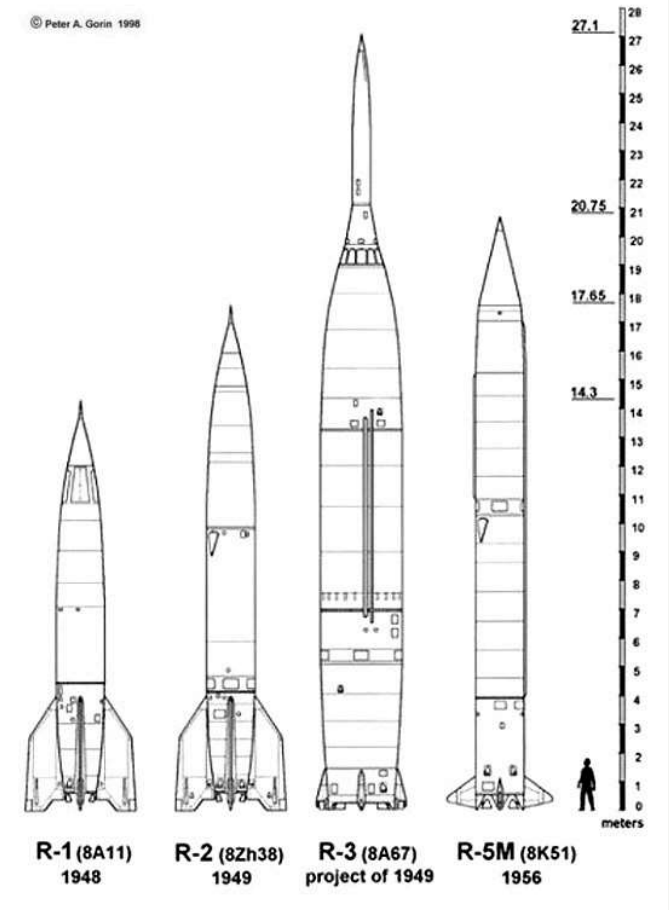
Long-range ballistic missile project. Development of the project for a missile with a range of 3,000 km was started by the Resolution of the USSR Council of Ministers dated April 14, 1947 at NII-88 under the general supervision of S.P. Korolev. A Council of Chief Designers was formed to work on the project:
- missile - S.P. Korolev (NII-88);
- command devices - V.I. Kuznetsov (NII-944 created in 1947);
- liquid-propellant rocket engine - V.P. Glushko (OKB-456);
- ground equipment of the launch complex - V.P. Barmin;
- autonomous control system - N.A. Pilyugin;
- radio correction system - M.A. Ryazansky.

The preliminary design of the missile consisted of three sections: on the R-3 missile (Department No. 3 of S.P. Korolev Research Institute-88, leading layout designers K.D. Bushuyev and S.S. Kryukov), on the propulsion system (OKB-456 V.P. Glushko on a competitive basis with Research Institute-1 MAP under the supervision of A.I. Polyarny), and on the control and monitoring systems (chief designers N.A. Pilyugin and M.S. Ryazansky). Several missile variants were being developed: BN - normal ballistic (single-stage), BS - ballistic composite, KN - normal winged (single-stage), KS - winged composite.

The preliminary design of the R-3BN missile variant was completed in June 1949. In November-December 1949, the project was discussed at specialized sections of the Scientific and Technical Council of NII-88, and on December 7, 1949, the preliminary design was approved by the Scientific and Technical Council of NII-88. The Scientific and Technical Council recommended the creation of an experimental scaled-down R-3A missile model to test the technical solutions of the R-3 project. The design of the experimental R-3A missile based on the technical solutions of the R-2 missile was started, and flight tests were scheduled for October 1951.

Changes in the design of the R-3A missile made it possible to expect a flight range of up to 935 km with a launch weight of 23,400 kg, an engine thrust of 40 tons, and a dry missile weight of about 4 tons. Design studies showed that by slightly complicating the task, it was possible to obtain a qualitatively new result and, bypassing the experimental stage, immediately create a design for a new combat missile - such a missile became the 8 A62 / R-5 missile, the design of which began in 1950-1951.

For work on the R-3 project and other long-range missile projects, on April 24, 1950, the USSR Council of Ministers issued a Resolution on the establishment of OKB-1 and the appointment of S.P. Korolev as its head and chief designer. In October 1951, Korolev approached the Minister of Armaments D.F. Ustinov with a request to approve in principle the transfer of the project of the experimental R-3A missile into the project of a combat missile with a flight range twice that of the R-2 missile, to assign it the index R-5 and to postpone the start of its flight tests to 1952. At the same time, a preliminary design of the missile with a new warhead was presented.



Missiles of NII-88 S.P. Korolev - R-1, R-2, R-3 and R-5M

Author: DIMMI Created: 15.08.2010 23:28:05 Comments: 27 READ THE FULL ARTICLE

RS-22 / RT-23 - SS-24 SCALPEL

DATA FOR 2023 (in progress)
BZHRK, missile 15Zh43 / RT-22
Complex 15P044 / RS-22, missile 15Zh44 / RT-23 - SS-24 SCALPEL
Complex 15P952 / RS-22A, missile 15Zh52 / RT-23 - SS-24 mod.1 SCALPEL
★★★

An intercontinental ballistic missile with solid-fuel engines in different basing options. Developed by the Yuzhnoye Design Bureau (Dnepropetrovsk) under the leadership of General Designer V.F. Utkin.

During 1966-1974, the Yuzhnoye Design Bureau released 7 preliminary designs, preliminary designs, and developments of solid-fuel missile projects, including the Garantiya research and development project and work on the RT-21 (15Zh41) and RT-22 (15Zh43) missiles.

In 1966-1967, OKB-586 (Yuzhnoye Design Bureau) conducted design research on the development of a combat railway missile system (BZhRK) with the R-12 missile. The project envisaged the creation of a special train of 20 cars, six of which were simultaneously a transport vehicle and a launcher for missiles. It was assumed that the BRZhK would provide the ability to covertly maneuver a missile formation on combat duty. However, the work did not progress beyond the design stage at that time. As rocket production developed, the possibility of creating a BZhRK applicable to the solid-fuel missiles RT-40, RT-2, RT-20. The project for a missile system with a solid- fuel three-stage silo- and rail-based ICBM RT-21 (15Zh41) was developed in the first half of the 1960s at Yuzhnoye Design Bureau. The project, like the previous ones, was not implemented. In the second half of the 1960s, a project of a mobile combat railway missile system with an RT-22 missile was developed on its basis, which was also not completed. In the late 1960s, information appeared about the development in the USA of a project of a railway train for launching Minuteman-type ICBMs, which gave a start to work on a mobile combat railway missile system with an RT-23 missile.

The order of the Minister of General Machine Building of the USSR "On the creation of a mobile combat railway missile system (BZhRK) with an RT-23 missile" was signed on January 13, 1969, after the development of a missile system with an RT-20P missile was terminated at the Yuzhnoye Design Bureau. The Yuzhnoye Design Bureau became the lead developer of the system and the missile for it. The BZhRK was to form the basis of the retaliatory strike group, since it had increased survivability and could with a high probability survive the enemy's first strike. This basing method ensured high mobility for the missile system. It was believed that it would be difficult to track down the BZhRK continuously running along the country's extensive railway lines, clogged with ordinary trains. The developed draft design raised a lot of objections from the military due to the possible vulnerability of the complex to sabotage and the difficulties in organizing rail traffic. Nevertheless, in October 1975, construction began at the Pavlograd Mechanical Plant.
solid-fuel motor assembly housings for the RT-23 ICBM.

In a separate article:
Complex 15P960 / RS-22B "Molodets", missile 15Zh60 / RT-23UTTH - SS-24 mod.2 SCALPEL
Complex 15P961 / RS-22B "Molodets", missile 15Zh61 / RT-23UTTH - SS-24 mod.2 SCALPEL
Complex "Tselina", missile 15Zh62 / RT-23UTTH

Launch of the 15Zh52 ICBM from the launch car of the BZhRK at the Plesetsk test site (https://nevskii-bastion.ru/, processed)

Author: DIMMI Created: 02.10.2011 21:19:32 Comments: 410 READ THE FULL ARTICLE

Meteorite, missile 3M25 / X-80 - SS-NX-24 SCORPION / AS-X-19 KOALA / SSC-X-5

DATA FOR 2013 (standard update)
P-750 / 3K25 "Meteorit-M" complex, 3M25 "Thunder" missile - SS-NX-24 SCORPION
Meteorit-A complex, 3M25A "Thunder" missile / X-80 / product 255 - AS-X-19 KOALA
Meteorit-N complex, 3M25N "Thunder" missile - SSC-X-5 SCORPION

Long-range cruise missile. Developed by OKB-52 (NPO Mashinostroyenia, Reutov) under General Designer V.N. Chelomey. Preliminary development of the design of a universal supersonic cruise missile in terms of carriers was carried out as part of the Meteorit R&D project since 1973 (source). The USSR Council of Ministers issued a decree on the creation of sea-, air- and land-based cruise missiles (including the Meteorit universal strategic cruise missile) on December 9, 1976. The missile was designed in three basing variants: sea-based (for Project 949M SSGNs), air-based (for the Tu-95 and possibly the Tu-160), and land-based (probably with a self-propelled launcher). The preliminary design of the sea-based complex was approved in December 1978, and the air-based design in January 1979. The development of liquid engines for the booster stage was conducted by the Chemical Automation Design Bureau (KBKhA) from 1977 to 1988. The missiles were manufactured at the Khrunichev Plant. Preliminary tests of the missile for wing extension and cruise engine launch were conducted at the NPO Mashinostroyeniya in Reutovo.

The first launch of the sea-based version of the Meteorit cruise missile from a ground test site at the Kapustin Yar test site took place on May 20, 1980. The missile failed to exit the launcher container and partially destroyed it. The next three launches were also unsuccessful. In the fifth launch on December 16, 1981, the missile successfully launched and flew about 50 km. According to unconfirmed data, in addition to launches from the ground test site, tests were also conducted using the PSK submersible test site in the Black Sea (probably the Balaklava test site). In total, more than 30 3M25 missile launches were conducted from the test sites in 1982-1987. Flight tests of the missile from the K-420 submarine, project 667M , consisted of three launches - on 27.12.1983, and one launch each in 1984 (06.11.1984) and 1986.

During the tests, the greatest problems were caused by the refinement of the correction systems based on the radio-contrast radar image of the terrain, failures of the plasma formation system of the cruise missile protection system from radar detection, and, in fact, the cruise missile launch process itself - since It was not possible to implement a supersonic launch of the missile's cruise engine, as envisaged by the terms of reference for the missile's creation.

After the missile development program was terminated (1993), about 15 ready-made 3M25 missiles remained at the Khrunichev plant.

Special thanks to the user "Sluchayny" from the forum http://militaryrussia.ru for help in working on the material.

Aircraft missile 3M25A "Meteorit-A" in the launch configuration (http://testpilot.ru)

Author: DIMMI Created: 11.10.2010 22:59:35 Comments: 130 READ THE FULL ARTICLE

Complex 14Ts033 Nudol, missile 14A042

DATA AS OF 2023 (standard replenishment)
Complex 14Ts033 / R&D "Nudol", missile 14A042 - PL-19
Anti-space defense complex / long-range missile interception complex with a space-based missile. The 14Ts033 firing complex with the 14P078 command and control center and the 14Ts031 radar is being developed under the R&D "Nudol" as a mobile anti-space defense complex, including for use in conjunction with the A-235 missile defense system . The lead developer of the complex is the Almaz-Antey Air Defense and Space Defense Concern (*source - GSKB Annual Report*). The development of the 14A042 long-range intercept space missile is being carried out by the Novator Design Bureau (Yekaterinburg, General Designer F.Kh.Abdrakhmanov, *source - JSC Avangard* , source), the development of the 14P222 launcher on the MZKT chassis is being carried out by the Special Machine-Building Design Bureau (KBSM). In 2010, the Almaz-Antey Air Defense Concern developed the preliminary design (EDP) for the 14Ts033 complex, prepared the initial data for construction work, and developed the preliminary design for the 14Ts031 radar (source). In 2011, the Almaz-Antey Air Defense Concern developed the working design documentation for the 14Ts033 firing complex, the first stage working design documentation for the 14Ts031 radar complex, and the functional software design (source). In 2011, GSKB Almaz-Antey developed the initial version of the software and algorithmic support (SAS) of the command and computing center (CCC) (item 14P078) of the 14Ts033 complex; working design documentation was developed for the component parts of the CCC 14P078 in terms of the container body and hardware container, as well as the program and methodology for field testing of the CCC 14P078 (source). In 2013, the Almaz-Antey Air Defense Concern completed the development of working design documentation and manufactured installation lots of the main functionally complete units of the 14Ts031 radar with a digital adaptive phased array (*source - Annual Report for 2013*). In 2013, the Design Bureau of Special Machine Building (KBSM) manufactured and shipped the MZKT chassis for the 14P222 (P222) launcher of the firing complex, ensured the manufacture of launcher equipment in the agreed volume, and developed an engineering note and RKD for the manufacture of a prototype of the hydraulic power supply system (source). *All data on the system are hypothetical and taken from open sources and the media. The list of sources is attached. The designation PL-19 means "unidentified object discovered at the Plesetsk No. 19 test site" (source).* ★★★

New 12 x 12 MZKT chassis, which can presumably be used as the chassis of the P222 launcher of the 14Ts033 Nudol air defense system, 2018 (source).

Author: DIMMI Created: 10.05.2014 20:04:40 Comments: 72 READ THE FULL ARTICLE

S-75 - SA-2 GUIDELINE

DATA AS OF 2010 (in progress)
SA-75 Dvina complex, V-750 (1D) and V-750V (13D) missiles - SA-2 GUIDELINE mod.1
S-75 Desna complex, V-750VN (13D) missiles - SA-2 GUIDELINE mod.2
S-75M Volkhov complex, V-755 (20 D / 20 DP) missiles - SA-2 GUIDELINE mod.3
S-75M2 complex, 20D missiles - SA-2 GUIDELINE mod.4
S-75M3 complex, 5Ya23 missiles - SA-2 GUIDELINE mod.4
The Volga Complex (export version)
★★

Anti-aircraft missile system It was developed using the S-25 backlog in SKB-31 (a division of KB-1 for air defense issues) under the supervision of A.A. Raspletin and B.V. Bunkin in accordance with the USSR Government Resolution No. 2838-1201 of November 20, 1953 on the development and construction of a mobile anti-aircraft missile weapon system. The missile was developed by OKB-2 (now MKB Fakel), chief designer - P.D. Grushin.

Testing of the complex began in 1955 on an experimental test site model of the SAM system. In mid-1956, testing of an experimental model of a mobile missile guidance station began. The SA-75 Dvina complex was accepted into service with the Air Defense Forces in 1957 (its first basing location was near Brest).

Polygon launcher with a 1D missile of the SA-75/SA-2 GUIDELINE complex (photo by MKB Fakel, http://pvo.guns.ru).

Author: DIMMI Created: 17.03.2009 00:24:14 Comments: 45 READ THE FULL ARTICLE

Missile 9M730 Burevestnik / Cruise missile with nuclear power plant - SSC-X-9 SKYFALL

DATA FOR 2023 (standard update)
Missile 9M730 "Burevestnik" - SSC-X-9 SKYFALL / KY-30
★★★

Strategic cruise missile with a nuclear power plant / cruise missile with unlimited range. The lead developer of the missile complex is presumably the Rosatom concern. The missile is presumably being developed by one of the missile design bureaus: Novator Design Bureau (Yekaterinburg), NPO Mashinostroyenia (Reutov) or Raduga Design Bureau (Dubna).

"At the end of 2017, a missile with a nuclear power plant was successfully launched at the Central Test Site of the Russian Federation. During the flight, the propulsion plant exceeded the specified power and provided the required thrust level. The flight tests, coupled with ground tests, make it possible to move on to the creation of a strategic nuclear weapons complex with a missile with a nuclear power plant" (*source - V.V. Putin, 01.03.2018*). It is known that the tests were supported by observation aircraft of the Gromov Flight Research Institute *(source)*.

On March 22, 2018, the cruise missile was named " Burevestnik " based on the results of an open vote on the website of the Russian Ministry of Defense .

All information provided in this article is presumptive and hypothetical and is based on the author's conclusions, unless the source of information is specified. The index "9M730" is taken from the media (source). However, it is quite possible that the index "9M730" has nothing to do with this product, but refers to the family of cruise missiles for the Iskander-M complex - since in 2015, the annual report of GosNIIP (State Research Institute of Instrument Engineering) for 2014 spoke of "the completion of state tests of missiles 9M728, 9M729 and their improved version", which may be the 9M730 product.

Launch of a 9M730 cruise missile with a nuclear power plant from a test site launcher. Pankovo test site, Novaya Zemlya, late 2017 (video first shown on 01.03.2018, http://mil.ru).

Author: DIMMI Created: 04.03.2018 23:25:02 Comments: 213 READ THE FULL ARTICLE

UR-100N / 15A30, UR-100N UTTH / 15A35 - SS-19 STILETTO

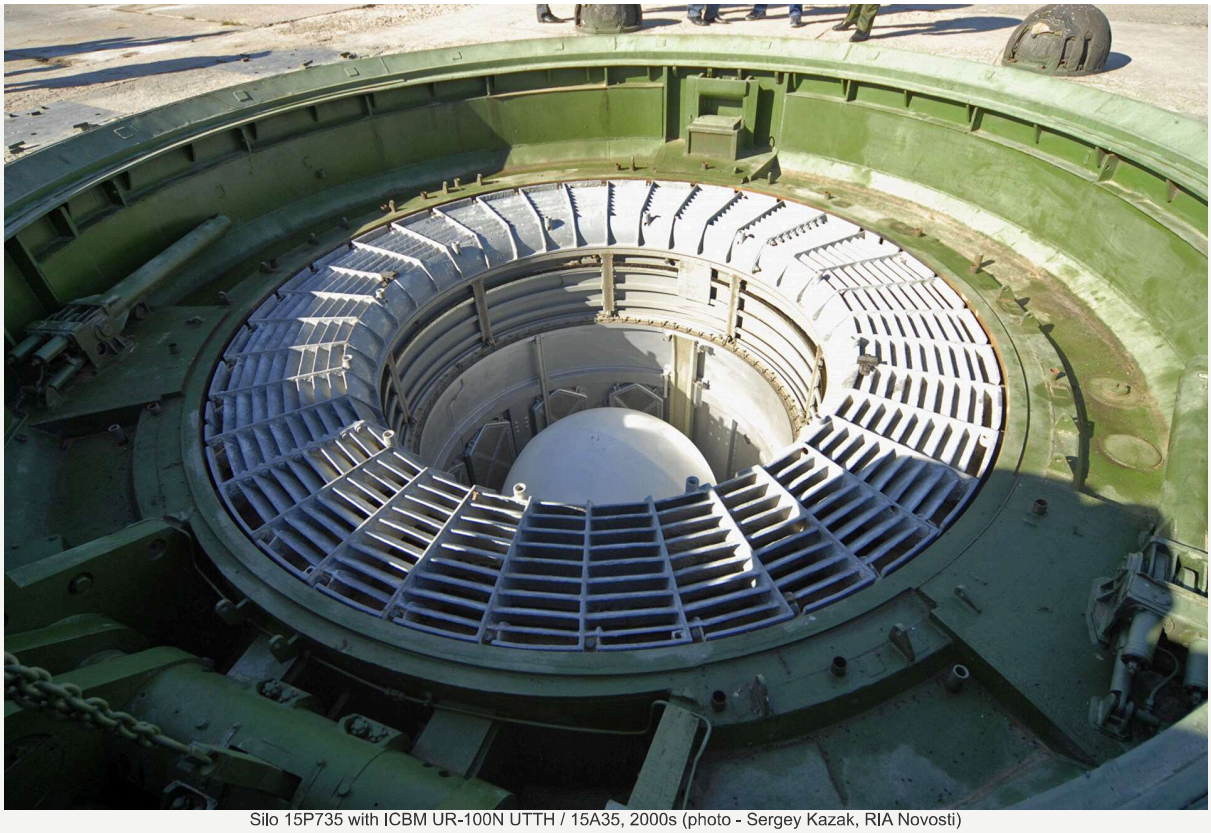
DATA AS OF 2023 (standard replenishment)
Complex 15P030, missile UR-100N / 15A30 / RS-18A - SS-19 mod.1 / mod.2 STILETTO
Complex 15P030P, missile UR-100N / 15A30
Complex 15P035 / 15P135, missile UR-100N UTTKh / 15A35 / RS-18B - SS-19 mod.3 STILETTO
★★★★

Intercontinental ballistic missile (ICBM) with a multiple reentry vehicle with six independently targetable warheads (MIRV). Developed by Branch No. 1 (chief designer - V.N. Bugaisky, leading designer - Yuri Dyachenko) of TsKBM / OKB-52 (since 2007 NPO Mashinostroyeniya) under the general supervision of V.N. Chelomey. In August 1969, a meeting of the USSR Defense Council was held under the chairmanship of L.I. Brezhnev, at which the prospects for the development of the USSR Strategic Missile Forces were discussed and proposals by the Yuzhnoye Design Bureau regarding the modernization of the R-36M and UR-100 missile systems already in service were approved. The TsKBM-proposed scheme for the modernization of the UR-100 system - the creation of a new UR-100N missile system - was also supported. The development of the ICBM began on September 2, 1969, and on August 19, 1970, the USSR Council of Ministers issued Resolution No. 682-218 on the development of the UR-100N/15A30 missile system with "the heaviest missile among the light ICBMs" (the term adopted in the treaties). The MR-UR-100 ICBM was created at the Yuzhnoye Design Bureau on a competitive basis with the UR-100N system. The UR-100N and MR-UR-100 systems were proposed to replace the UR-100/8K84 light ICBM family, accepted into service by the Strategic Missile Forces in 1967 and deployed in large numbers - the maximum number of UR-100 ICBMs, 1,030 units, was reached in 1974.

By order of V. N. Chelomey, the work on the rocket was divided into the following at the Central Design Bureau:
- cruise stages, test articles, coupling the rocket with the transport and launch vehicle and launcher silos, issuance of drawings to the Khrunichev Plant in December 1970 - Branch No. 1 of the Central Design Bureau (Head - V. N. Bugaisky);
- an autonomous unit with a separating warhead and a rocket control system with the issuance of working documentation to the plant in December 1970 - Central Design Bureau (Deputy General Designer A. I. Eidis);
- a transport and launch container, coupling with a complex of ground equipment and a launcher with the issuance of documentation to the Omsk Aviation Plant in December 1970 - Central Design Bureau (Deputy General Designer V. M. Baryshev);
- coupling of work on the creation of the positional area of the UR-100N missile system - Branch No. 1 of the Central Design Bureau.

To provide technical guidance and coordination of work at the Central Design Bureau of Machine Building, by order of the General Designer dated 20.10.1970, B.M. Denisov was appointed chief leading designer for the warhead of the UR-100N missile, and on 30.10.1970, V.Yu. Gasyunas was included in his group as leading designers for the body, technical documentation and production, and V.G. Bidenko for onboard units, ground equipment and testing.

During the development process, the following cooperation of enterprises was formed:
- OKB-52 (V.N. Chelomey) - lead design bureau for the complex and the missile;
- NPO Elektropribor (V.G. Sergeev, NPO Khartron, Kharkov) - control system;
- KBKhM (A.D. Konopatov, Voronezh) - main and steering liquid-propellant rocket engines of the missile's cruise stages;
- Central Design Bureau of Mechanical Engineering (V.M. Baryshev, Moscow) - highly protected silos;
- VNIIP (O.N. Tikhane) - development of a warhead with a thermonuclear charge.



Silo 15P735 with ICBM UR-100N UTTH / 15A35, 2000s (photo - Sergey Kazak, RIA Novosti)

Author: DIMMI Created: 15.03.2023 21:41:16 Comments: 1 READ THE FULL ARTICLE

Complex 15P159 Courier, missile 15Zh59 - SS-X-26

DATA AS OF 2023 (standard replenishment)
Complex 15P159 "Kurier", missile 15Zh59 - SS-X-26
★★★★

Mobile small-sized intercontinental missile / mobile ground missile system (PGRK). The development of the complex and the missile was carried out by the Moscow Institute of Thermal Engineering under the supervision of A.D. Nadiradze, since 1987 the chief designer is B.N. Lagutin. Development of the complex was started on the initiative of the Commander of the Strategic Missile Forces V.F. Tolubko in response to the development of the MGM-134 "Midgetman" ICBM in the USA in accordance with the Resolution of the CPSU Central Committee and the USSR Council of Ministers dated July 21, 1983 No. 696-213. The preliminary design of the ICBM (the name at the early design stage is “Temp-SM”) was completed in 1984. The development of the preliminary design for the theme “Temp-SM” was carried out by the 11th department of MIT, headed by N.V. Karyagin. At the R&D stage, Department No. 6 of MIT (A.K. Vinogradov, later - L.S. Solomonov) was responsible for the complex, and Department No. 1 of MIT (V.I. Gogolev, later - Yu.V. Solomonov) was responsible for the rocket.

The production of the experimental batch of missiles for testing was carried out at the Votkinsk Machine-Building Plant. It was also planned to launch serial production of the missile there.

The 15U160 test launcher on the MAZ-7909 chassis was tested with mock-up missile prototypes at the Kapustin Yar test site in 1989-1990. Between March 1989 and May 1991, 4 missile mock-up launches (IRS - test missile projectile) were performed at the Plesetsk test site during testing of the launch automation and self-propelled launcher according to a simplified cyclogram with a lightweight first-stage engine.

By 1991, the final 5-axle version of the 15U160M SPU complex had been developed, and production of SPU prototypes had begun on the "Barrikady" code (Volgograd). Flight tests of the missile were planned to begin in the summer of 1992, but due to the termination of the development of the Midgetman ICBM in the United States, on October 5, 1991, M.S. Gorbachev announced the termination of the development of the Kurier complex.

Self-propelled launcher 15U160M of the 15P159 "Courier" missile system in the museum exposition of the Kapustin Yar test site, 2021 (photo - user "Sluchayny" of the forum http://militaryrussia.ru/)

Author: DIMMI Created: 18.01.2011 23:30:09 Comments: 221 READ THE FULL ARTICLE

RT-2PM2, 15Zh55 / 15Zh65 Universal - SS-27 SICKLE-B

DATA FOR 2023 (standard update)
R&D "Universal", complex 15P065, missile RT-2PM2, 15Zh55 / 15Zh65 - SS-X-27 SICKLE-B
★★★

Project of a universal intercontinental ballistic missile (ICBM for silo and mobile basing) developed by the Yuzhnoye Design Bureau (Dnepropetrovsk, general designer - V.F. Utkin) and the Moscow Institute of Thermal Engineering (MIT, chief designers - Boris Nikolaevich Lagutin and Yuri Semenovich Solomonov, in different years, source). Development of the silo version of the ICBM began in 1984 (*source - Morozov*).

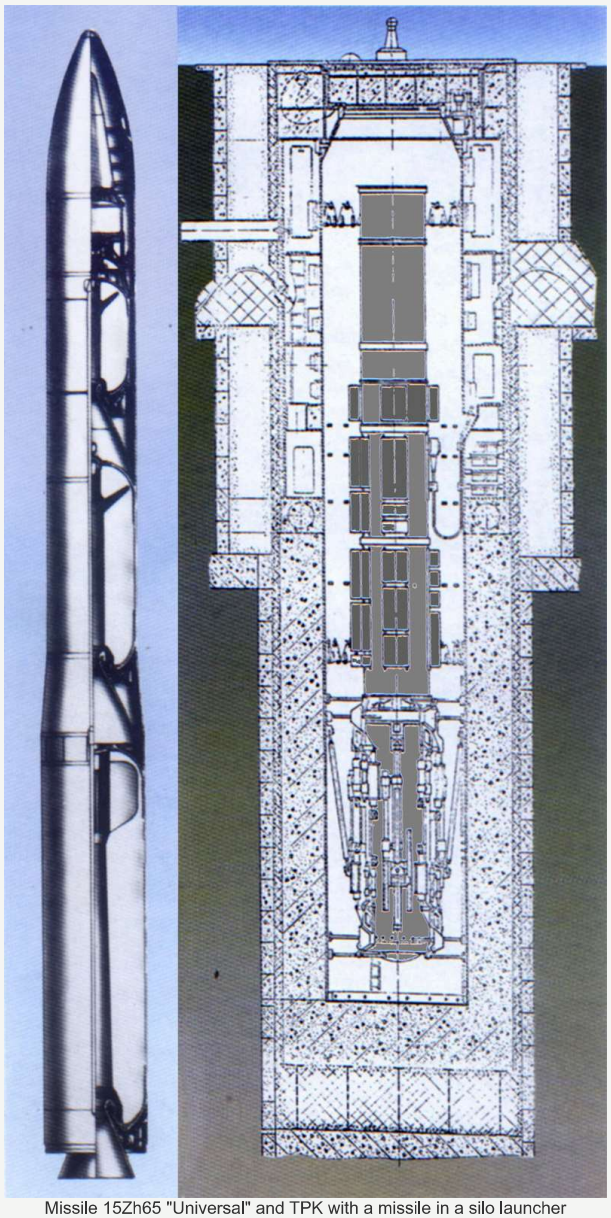
By Resolution of the Council of Ministers of the USSR No. 173-45 of February 9, 1987, it was prescribed to begin simultaneously at NPO Mashinostroyeniya (Reutov, the Albatross project), at the Yuzhnoye Design Bureau (Dnepropetrovsk) and at the Moscow Institute of Thermal Engineering work on developing advanced ICBMs with the ability to overcome the multi-echelon missile defense system of a potential enemy with universal basing - with launch options from silo launchers and in the form of a PGRK (*source - Strategic missiles, source*).

To comply with the requirements of the START-1 Treaty and as a conditional modernization of the RT-2PM ICBM according to the Universal research work, a solid-fuel ICBM with a single-block warhead in the PGRK and silo launcher variants was developed at the Yuzhnoye Design Bureau. At the same time, work was underway at MIT on the Topol-M R&D project - the development of an ICBM to replace the Topol ICBM with two types of basing - a ground-launched missile system and a silo launcher. In August 1988, Yu. S. Solomonov (MIT) held talks with the Yuzhnoye Design Bureau, as a result of which, by the end of 1988, the two design bureaus had jointly developed a technical proposal for a single missile within the framework of the Universal R&D project (*historical - Strategic Missiles*).

Joint full-scale development of the RT-2PM2 missile on the Universal research project was started by MIT and Yuzhnoye Design Bureau by decision of the Military-Industrial Complex under the USSR Council of Ministers No. 323 of September 9, 1989 and by order of the USSR Minister of General Machine Building No. 222 of September 22, 1989. The design was planned to be completed by the end of 1991 in two versions:
1) a missile with a platform for distributing unguided warheads with solid-propellant rocket engines and without a missile defense overcoming means complex (MBC) - developer MIT (mobile missile complex, PGRK)
2) a missile with a platform for distributing warheads with a monopropellant liquid rocket engine and with MBC - developer - Yuzhnoye Design Bureau (Dnepropetrovsk, silo missile complex 15P065 with a missile 8Zh65 / 15Zh65).

Due to a number of reasons of the production nature of the missiles, the design of the TPK differed and therefore had some differences and received different indexes - 15Zh55 for the PGRK and 15Zh65 for the SHPU (*history - Strategic missiles*).

The development of the 1st stage, the version of the platform for distributing the BB on monopropellant and the nose cone of the missile was carried out by the Yuzhnoye Design Bureau, the development of the 2nd and 3rd stages, the instrument compartment,MIT developed its own version of the platform for separating the BB and the unguided warhead. The engine for the 1st stage was also developed by the Yuzhnoye Design Bureau (*ist. - Missiles and spacecraft* , *Strategic missiles*). On December 29, 1989, the joint preliminary design of the missile and silo version of the missile complex was successfully defended (*ist. - Utkin*). The development of design documentation began. In the first half of 1990, the preliminary design of the PGRK was released (*ist. - Strategic missiles*).



Missile 15Zh65 "Universal" and TPK with a missile in a silo launcher
(Missiles and spacecraft of the Yuzhnoye design bureau. Dnepropetrovsk, Yuzhnoye State Design Bureau, 2000)

Author: DIMMI Created: 01.01.2021 02:55:50 Comments: 2 READ THE FULL ARTICLE

Complex 9K333 Verba, missile 9M336 - SA-25

DATA AS OF 2022 (standard replenishment)
9K333 "Verba" system, 9M336 missile - SA-25
★★★

Man-portable air defense system (MANPADS). Developed by the Machine-Building Design Bureau (Kolomna) based on the Igla-S MANPADS.

In 2007, the system underwent flight design tests. State tests of the system were planned for 2009-2010. Troop tests at the R&D stage began at the proving ground of the 726th training center of the ground forces in Yeysk, Krasnodar Krai, on June 9, 2011. During 2011, it was planned to complete the R&D on the creation of the system and purchase 250 MANPADS for the ground forces under the 2011 order. Qualification tests of the MANPADS were successfully completed in the spring of 2014 (source).

As of 2008, it was planned to adopt the MANPADS into service by the end of the year. In 2012, re-equipment of production for the 9K333 systems began at the cooperation enterprises for the production of MANPADS. In particular, re-equipment work was carried out at the Machine-Building Design Bureau in terms of manufacturing automated test stands (source). In 2012, production of 9M336 missiles began at Production No. 21 of the Degtyarev Plant (Kovrov, source), where the 9K333 MANPADS are probably also produced.

In 2013, a contract was signed with the Russian Ministry of Defense for the delivery of four brigade sets of MANPADS for the ground forces and four divisional sets for the Airborne Forces during 2014-2015 (source). The first serial batch of 9M336 SAMs was released in May 2014 (source). In early June 2014, the media reported on the first deliveries of the Verba MANPADS to the anti-aircraft regiment of the 98th Airborne Division of the Russian Armed Forces (Ivanovo Region), which took place in late May 2014. At the end of November 2015, the 2013 contract was fully fulfilled.

Model of the 9K333 "Verba" MANPADS at the "Army-2015" forum (photo - A.V. Karpenko, nevskii-bastion.ru).

Author: DIMMI Created: 18.06.2011 08:24:01 Comments: 20 READ THE FULL ARTICLE

R-36M / 15A14 / RS-20A - SS-18 mod.1-3 SATAN

DATA AS OF 2023 (standard replenishment)
Complex 15P014, missile R-36M / 15A14 / RS-20A - SS-18 mod.1-3 SATAN
Complex 15P014P
★★★★

Intercontinental ballistic missile (ICBM). The missile was developed by the Yuzhnoye Design Bureau (Dnepropetrovsk, General Designer - M.K. Yangel, from 01.10.1970 - V.F. Utkin). By the decision of the USSR Defense Council dated August 27, 1969 in Yalta, the design bureau's proposals were approved for the creation of modernized mortar-launched missiles - the 15A14 / R-36M heavy ICBM with installation in hardened OS-67 silos and the 15A15 / MR UR-100 light ICBM with installation in hardened OS-84 silos, as well as a combat railway missile complex with ICBMs.

The following main principles were used in the development of the project:
- development of an autonomous inertial control system based on an on-board digital computer (BDCM) and a complex of command instruments (CCI) with increased accuracy;
- creation of a multiple warhead (MIRV) with individual guidance of warheads to aiming points;
- creation of warheads with improved overall dimensions and ballistic characteristics, resistant to the damaging factors of a nuclear explosion (PFYAV);
– development of a system of means for overcoming enemy anti-ballistic missile defense (ABM), including false targets operable at all stages of the trajectory;
– operation of the missile at all stages in the transport and launch container (TLC), placement on the TLC of all equipment and apparatus necessary for combat duty and missile launch;
– mortar launch of the missile from the TLC, placed in a silo launcher with the launch of the first stage engines of the missile after its exit from the TLC.

On September 2, 1969, Resolution No. 712-247 of the CPSU Central Committee and the Council of Ministers "On the development and manufacture of the R-36M (15A14) missile system with entry into flight testing in 1971" was issued. The development of the complex with ICBMs was carried out by the following cooperation of enterprises:
- Yuzhnoye Design Bureau - the missile and the complex as a whole;
- KBEM and KBKhA - liquid-propellant rocket engine control systems of sustainer stages;
- Kharkiv Design Bureau of Electrical Instrument Making and NIIPM - control system;
- NPO Altai and TsNIRTI - KSP PRO; -
KBSM and TsKBTM - launch complex and silo;
- LNPO Soyuz - PAD;
- TsKBTM - KP;
- VNIIEF - BB charges.

At the first stage of designing the 15A14 missile, it was assumed that the same approach would be used on the sustainer stages as on the previously created missiles of the R-36 family - i.e. a high-altitude modification of the first stage engine was assumed to be used as the second stage sustainer engine. As a result of the design development of such a scheme (6-chamber propulsion system at the 1st stage and 2-chamber propulsion system at the 2nd stage), a decision was made to use a combined propulsion system developed by KBKhA with a cruise and steering liquid-propellant rocket engine at the 2nd stage (*source - Rachuk*).

In December 1969, a preliminary design of the 15A14 ICBM with 4 types of warheads was prepared: light and heavy single-warhead warheads, multiple MIRVs, and a maneuvering warhead. In March 1970, the preliminary design of the 15A14 ICBM was accepted (*source: Zadontsev*). In August 1970, a proposal was approved to develop a missile system with highly protected silos. In January 1971, experimental throw-out launches from the TPK began at a test site near Pavlograd (*see below*).

Launch of 15A14 ICBM with heavy mono-warhead, processed by MilitaryRussia

Author: DIMMI Created: 06.09.2022 22:34:25 Comments: 3 READ THE FULL ARTICLE

9K52 Luna-M - FROG-7

DATA FOR 2023 (standard update)
Complex 9K52 "Luna-M", rocket 3P11/9M21/P-65 - FROG-7A
Complex 9K52 "Luna-M", rocket 9M21-1 / R-70 - FROG-7B
Complex 9K53 "Luna-MV" (helicopter), missile 9M21
Complex 9K52M "Luna-3"
★★★★

Tactical missile system. Resolution No. 247-104 of the USSR Council of Ministers on the creation of the system was issued on March 16, 1961. Developer: NII-1 (since 1967 - Moscow Institute of Thermal Engineering, Chief Designer - N.P. Mazurov) together with OKB-329 GKAT. The first launch of the experimental 3R11 / 9M21 missile with a range launcher took place on December 27, 1961. Range tests of the system with the 9P113 SPU - 1964 (Rzhevka range).

Based on the test results, the 9K52 system was accepted into service on August 6, 1964, serial production of the SPU was launched at the Barrikady plant and the system began to be delivered to the troops. In 1964, the 3rd Central Research Institute of the USSR Ministry of Defense prepared firing tables for the Luna-M system. In 1968, under the same designation 9M21, the missile of the complex was replaced by a modernized version of the missile - R-70 (9M21F1 and other models of the 9M21-1 type).

The complex has been decommissioned since 1986 (according to Western data).

Launcher 9P113 with 9M21 missile of the 9K52 "Luna-M" FROG-7 complex of the Syrian armed forces, photo probably from 2012-2013 (source).

Author: DIMMI Created: 13.04.2009 23:56:36 Comments: 157 READ THE FULL ARTICLE

Complex 9K720 Iskander - SS-26 STONE

DATA FOR 2023 (standard update, v.2)
Complex 9K715 "Iskander", missile 9M723 - SS-X-26 STONE
9K720 Iskander-M complex, 9M723-1 missile - SS-26 STONE-A
9K720E Iskander-E complex, 9M723E missile - SS-26 STONE-B
9K720 Iskander-M complex, 9M728 / R-500 ("Iskander-K") missile - SS-26 STONE-S
★★★★★

Operational-tactical missile system / multipurpose modular missile system of the ground forces. The development of the system was carried out using the developments of the Tochka , Oka , Oka-U and Volga systems . It is also likely that the system was created taking into account the Volna research and development work on the study of the concept of a multipurpose modular missile system for the ground forces. The origins of the system's development date back to the Iskander research and development work, which has been conducted since 1978. The research and development work included studying the possibility of placing two 9M79 Tochka class operational-tactical missiles on a self-propelled launcher similar to the 9K714 Oka system's self-propelled launcher. The main goal is to create an operational-tactical missile with a range of up to 400 km to replace the 9K72 system with an 8K14 missile with increased combat performance, as well as to ensure guaranteed destruction of particularly important targets with two missiles. According to unconfirmed data, the Iskander R&D was discontinued in the first half of the 1980s at the stage of developing the missile aiming and control systems.

The development of the Iskander complex in its original form was started at the Machine-Building Design Bureau (Kolomna, hereinafter referred to as KBM) on its own initiative by order of Chief Designer S.P. Nepobedimy and under his leadership in 1987. KBM's competitor in developing the new generation of operational-technical systems was the Tula Instrument-Making Design Bureau under the leadership of A.G. Shipunov, which proposed its own project . The USSR Council of Ministers issued a resolution on financing the design work for the complex in 1988. When creating the complex, the task was set to ensure interaction as part of the RUK Ravenstvo with the M-55 target designation aircraft (developed by RUK - NIIEMI). The original project may have planned to use the 9P76 SPU with one missile. The command post of the RUK "Equality" was designed on the MAZ-543 chassis (the command post is similar to the command post of the "Polyana").

Special thanks to missile veterans "Pensioner" (http://russianarms.ru), "Lyubitel" (http://paralay.iboards.ru) and others for their help in preparing materials and to user "Sluchayny" from the forum http://militaryrussia.ru for unique photo materials.

Self-propelled launcher 9P78-1 of the 9K720 Iskander-M missile system with a 9M723 missile during missile brigade exercises in Primorye, November 14-18, 2016 (http://smitsmitty.livejournal.com/).

Author: DIMMI Created: 20.09.2014 19:47:10 Comments: 0 READ THE FULL ARTICLE

Gnome (project)

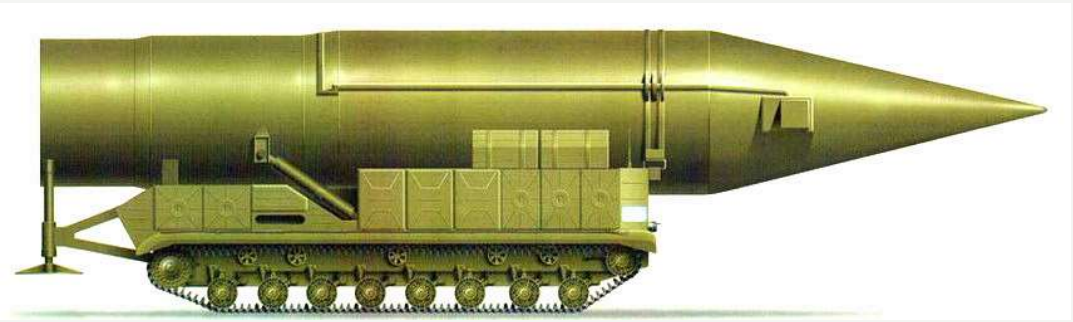
DATA AS OF 2023 (standard replenishment)
"Gnome"
★★★

Intercontinental ballistic missile (ICBM). Work on mobile solid-fuel strategic missiles was initiated by D.F. Ustinov. NII-1 (MIT) and OKB-586 (Yuzhnoye Design Bureau, Dnepropetrovsk) together with SKB (KBM, Kolomna) were involved in the design of the systems on a competitive basis. SKB (KBM) was responsible for the development of the missile's solid-fuel engine. After the ramjet was selected as the 1st stage engine, OKB-586 refused to participate in the project due to the non-standard nature of such a solution for a long-range missile. Further research and development work on the creation of an ICBM with a ramjet at the first stage was carried out independently by the SKB Machine-Building Design Bureau (Kolomna) since 1964. The General Designer was Boris Ivanovich Shavyrin (later - S.P. Nepobedimy).

For pilot production on the "Gnome" project, KBM was allocated Plant No. 92 in Gorky. Until October 1965, fire tests (more than 10) of a reduced prototype of the missile's ramjet (1/3 the size) were conducted at the TsIAM test site in Turaevo. Special equipment was mounted on the air injection stand. A total of more than 10 fire tests of the engine were conducted.

Plant No. 92 was producing engine sections and the Design Bureau was preparing to assemble the first full-size model of the missile. By October 1965, a preliminary design for the complex and the missile was developed. On October 16, 1965, the first fire test of the ramjet prototype took place at the TsIAM stand in Turaevo. After October 1965, under the leadership of S.P. Nepobedimy, the missile was reconfigured and R&D work on the creation of an ICBM was started. The draft design was successfully defended, and the release of working drawings of the missile began.

According to some sources, the development of the missile and the complex was stopped at the end of 1965 before the product entered flight tests. According to information in the memoirs of the design bureau, in 1967 at a meeting of the Military-Industrial Commission under the USSR Council of Ministers, a decision was made to close the Gnome project.



Self-propelled launcher type SM-SP21 for ICBM "Gnome" (http://www.razlib.ru/ , processed).

Author: DIMMI Created: 12.04.2014 00:22:18 Comments: 8 READ THE FULL ARTICLE

100mm gun T-12 / MT-12 Rapira

DATA FOR 2013 (standard update)
T-12 / 2A19 - M1955
MT-12 / 2A29 "Rapier"
MT-12R / 2A29R "Rapier"

★★★

100 mm anti-tank gun. The gun was developed by the Design Bureau of the Yurginsky Machine-Building Plant No. 75 (Yurga) under the supervision of V. Ya. Afanasyev and L. V. Korneev. The first serial version, the T-12, was adopted for service in 1953, serially produced since 1955 and in 1955 identified by Western observers as the M1955.

Later, after changes were made to the design of the carriage in 1971, a modernized version of the MT-12 "Rapira" gun was adopted for service. Serial production of the MT-12 gun began in 1970. The gun was in widespread use by the armies of the Warsaw Pact countries.

The MT-12 "Rapira" cannon of the Yekaterinburg separate motorized rifle brigade of the Central Military District takes part in extinguishing a fire at well No. P23 U1 near Novy Urengoy, published on 26.08.2013 (http://function.mil.ru).

Author: DIMMI Created: 19.06.2012 22:07:55 Comments: 8 READ THE FULL ARTICLE

122mm howitzer D-30/2A18

DATA AS OF 2015 (standard replenishment)
D-30 / 2A18
D-30A / 2A18M
D-30A-1 / 2A18M -1

★★★

122 mm howitzer. Developed in the late 1950s by OKB-9 under the supervision of F.F.Petrov. Presumably, German developments from the Great Patriotic War were used in the creation of the gun. The howitzer was accepted into service and has been mass-produced since the early 1960s by Artillery Plant No. 9 (Yekaterinburg, now OJSC Plant No. 9). One of the most widespread post-war artillery pieces. By 1994, production of the basic model of the howitzer in Russia ceased.

Howitzer D-30A / 2A18M from the RAE-2013 exhibition, Nizhny Tagil, September 25-28, 2013 (photo - Ilya Kramnik, http://legatus-minor.livejournal.com/).

Author: DIMMI Created: 25.03.2011 00:28:52 Comments: 3 READ THE FULL ARTICLE

A-135 Amur system, 5Ya26/PRS-1/53T6 missile - ABM-3 GAZELLE (2)

DATA AS OF 2023 (standard replenishment, v.2)
A-135 ABM system, 5Zh60P "Amur-P" complex, 5Ya26 / PRS-1 - ABM-X-3A / SH-08 missile
A-135 / RTC-181 ABM system, 5Zh60 "Amur" complex, PRS-1 missile / 53T6 - ABM-3A GAZELLE / SH-08M
A-235 / RTC-181M ABM system , PRS-1M / 53T6M missile
★★★★

Atmospheric high-speed short-range anti-missile of the A-135 ABM system . The missile was developed by OKB-8 / OKB "Novator" under the leadership of Lev Veniaminovich Lyulyev (later Chief Designer Pavel Kamnev) starting in 1967 for the S-225 object ABM system . After the conclusion of the ABM Treaty in 1972, the preliminary design of the A-135 ABM system was redesigned by the Scientific and Technical Center of the Vympel Scientific and Production Association (chief designer A.G. Basistov). Instead of the S-225 ABM system, the ABM system was equipped with a close echelon with 5Ya26 missiles of the S -225 system. Accordingly, the 5Ya26 missile was introduced into the Amur firing complex of the A-135 system . At the end of 1973, the design of the A-135 ABM system with PRS-1/53T6 missiles (new index of the 5Ya26 missile) was approved by the customer - the USSR Ministry of Defense.

In the period 1973-1978, the 5Ya26 missile was tested as part of the experimental S-225 ABM system . The first throw-out launch of the missile as part of tests for the Azov complex of the S-225 system was conducted at site No. 35 ("Ethylene", military unit 03145) of the 10th State Research Test Site Sary-Shagan on November 27, 1973. Factory tests of the missile using the Azov complex of the S-225 system began in 1978. The tests were completed with the successful destruction of a ballistic target, an 8K65 missile, on April 28, 1984; the miss was 50 m at a range of 40 km. This was the last launch of the PRS-1 using the S-225 complex .

In July 1979, the first throw-out launch of the PRS-1 / 53T6 (SH-08) short-range interceptor missile was conducted at site 35 using the Amur-P complex of the A-135 system. The first launch of the 53T6 missile in a closed control loop was carried out in July 1981. On June 18, 1982, two 5Zh60P Amur-P anti-missiles at the Sary-Shagan test site intercepted RSD-10/SS-20 ballistic missiles (launched from the Kapustin Yar test site) and R-29 SLBMs (launched from a Northern Fleet SSBN).

Factory test sites of the A-135 system with the first stage equipment began in November 1982 and were completed in March 1984 (including 5 launches of 53T6 missiles, including 4 in a closed control loop). In 1984, the PRS-1/53T6 anti-missile was officially included in the A-135 missile defense system. Since the mid-1980s (according to Western data), 53T6 missiles began to replace the ABM-1 Moscow missile defense system. Tests of the A-135 "Amur-P" system with the second stage equipment were conducted from March to October 1987 (including 5 launches of 53T6). After some modifications to the system, another stage of control tests of the range model was conducted - January-July 1988 (including 3 launches of 53T6).

Missile 53T6 / PRS-1 / ABM-3 GAZELLE in the Ukrainian Museum of Rocket Technology, 2019 (http://www.russianarms.ru/)

Author: DIMMI Created: 03.01.2017 14:49:31 Comments: 0 READ THE FULL ARTICLE

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